

Date: Tuesday, 19/08/2008 11:22:41 AM  
 User: Julie Lecocq

## Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: OH-58 FWD X-TUBE ASSEMBLY
Job Number	: 41398	Part Number	: D058676101
Estimate Number	: 12526	Drawing Number	: D058-676-141 REV. A2
P.O. Number	:	Project Number	: N/A
This Issue	: 19/08/2008 S.O. No. :	Drawing Revision	: A2
Prsht Rev.	: NC	Material	:
First Issue	: / / Type : CROSSTUBES	Due Date	: 05/09/2008
Previous Run	: 41397	Qty:	1 Um: Each
Written By	:		
Checked & Approved By	: <u>JUL 08.8.19</u>		
Comment	: Est Rev: E 06.09.11 Reformat IEC EST rev F 08.03.10 re-format lean DD verified by EC		



Additional Product

PRELIMINARY ISSUE

Job Number:



Seq: # Machine Or Operation: Description :

1.0

DC

DOCUMENT CONTROL



*for JD*  
*08.8.28*  
*08.10.28*



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D058-676-101 CHG001

*NEED CHG002*  
*08.10.28*  
*stidco*

2.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

3.0

D058676101TRN

Crosstube Turning Detail



Comment: Qty: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch *B37976*

*DP*  
*8-10-06*

4.0

BENDING

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per Dwg D058-676-141 using CNC bender program OH58-fw and Folio FT014

*DP*  
*8-10-06*

5.0

QC6

DIMENSIONAL CHECK



Comment: Inspect dimensions and work To Current Step

*08.10.08*

6.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube as per Dwg D058-676-141 using drill Jig DT8541 &amp; DT8542

*ET 08-10-09*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY

Job Number: 41398

Part Number: D058676101

Job Number:



Seq. #:	Machine Or Operation:	Description :
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	2-Ream hole to finish size in tube as per Dwg D058-676-141 using drill Jig DT8541 & DT8542. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.	25 08-10-09
--	--	-------------

	3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D058-676-141	- AUM 8-10-14
--	--	---------------

	4-Scribe part # and batch # using vibrating stylus as per Dwg D058-676-141 Inside of Cuff (Do not engrave on outside of tube)	25 08 -10-09
--	--	--------------

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Pressure wash as per QSI 005

2-Chemical Conversion Coat as per QSI 005 4.1

AUM 8-10-14

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

5 08/10/14

(40)

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

5 08/10/14

(40)

10.0

OUTSIDE SERV.10

OUTSIDE SERVICES -skids



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 0380

Issue P/O: 7407

LPI as per ASTM 1417 Level 2

Attach copy of NDT results to work order

0208110121 (1)

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage Ensure copy of NDT results attached to work order.

P 08/11/20 (1)

12.0

QC6

DIMENSIONAL CHECK



Comment: Inspect for damage & ensure results are as per Dwg D058-676-241

5 08/10/24 (40)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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**NOTE:** Date & initial all entries

Date: Tuesday, 19/08/2008 11:22:41 AM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

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Job Number: 41398

Part Number: D058676101

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PT 08-10-23

14.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Then, Wrap in plastic bag to protect from scratches

2008/10/23 @

15.0

D2856400

Abrasion Strip



Comment: Qty.: 0.5800 f(s)/Unit Total : 0.5800 f(s)

Pick:

Qty Part number

Description

Batch

2 D2856-400-694 Abrasion Strip

PTO

16.0

D28911

2.25 Support



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description

Batch

2 D2891-1

Support

37655

PT 08 10 27

17.0

MS21920-22

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number

Description

Batch

4 MS21920-20

Clamp

107501

PT 08 10 27

18.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579

2-Install supports and clamps as per Dwg D058-676-141. Torque clamps to 80-100 in lb.

PTO  
PT 08 10 27

# Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
08.10.22	15 18	SEE ATTACHED DWG REV B <u>REMOVE</u> D2356-400-694 (2) MS21920-20 (4)  Install Supports with  APD Masnoband 6393 MS21920-20 (4) D3595-075-400 (4) p Rubber Cushion  108 966 107501 40220 10 27	RH	08.10.22	ALL	RH 01.10.22	S 08/10/28	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries

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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

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Job Number: 41398

Part Number: D058676101

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

QC5

INSPECT WORK TO CURRENT STEP



**ENGINEERING  
APPROVAL**

Comment: INSPECT WORK TO CURRENT STEP

*8/10/28 / PH 08.10.28*

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

21.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 AN5-32A

Bolt

*4109061*

*SP*

22.0

AN960JD516

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

8 AN960JD516

Washer

*4109059*

*SP*

23.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 MS21042L5

Nut (or -5)

*4108827*

*8/10/28*

*(A)*

*SP*

24.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

*8/11/17 (4)*

25.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D058-676101

Location:

*Rev B*

*8/11/17*

**POSITIVE RECALL**

EFFECTIVE *08.10.22*

AUTH *PH*

RELEASED *PH*

DATE *28/11/17*

*PH 08.11.17*

*9/11/08 203*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



Date: Tuesday, 19/08/2008 11:22:41 AM  
User: Julie Lecocq

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY

Job Number: 41398

Part Number: D058676101

Job Number:



Seq. #:

Machine Or Operation:

Description :

26.0

QC21

FINAL INSPECTION/W/O RELEASE



08/11/17 *[Signature]*

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



MF 08-11-17

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

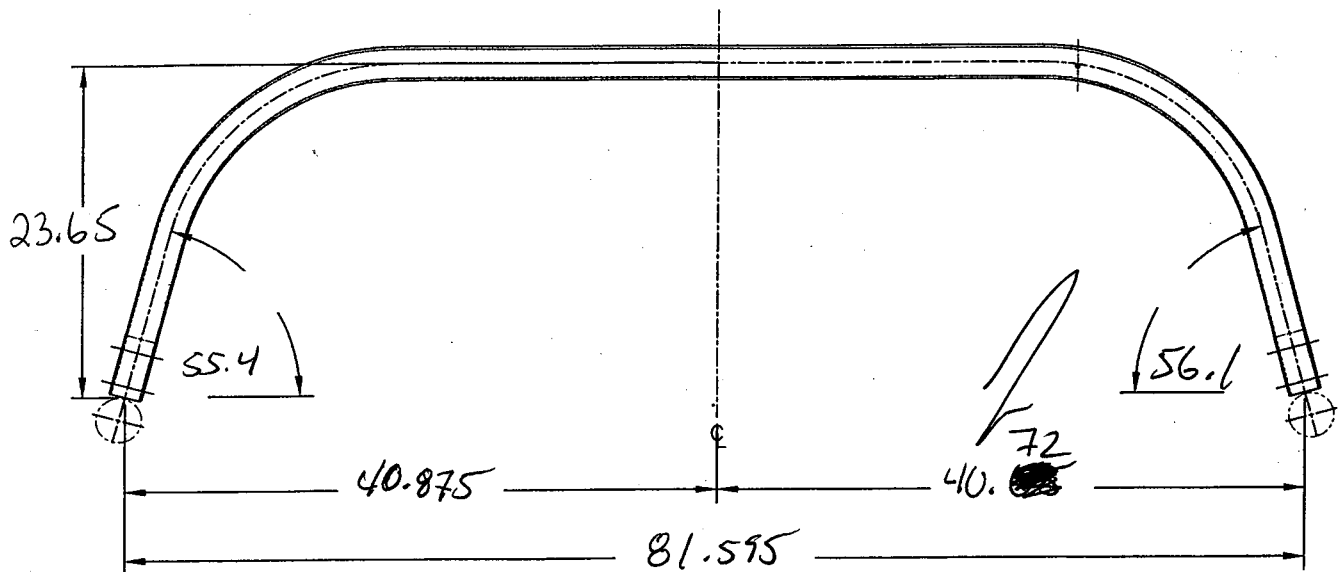
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

DART AEROSPACE LTD		Work Order:	41398
Description: Crosstube High Fwd (OH-58)		Part Number:	D058-676-101
Inspection Dwg: D058-676-141	Rev: A2		Page 1 of 1

Required Dimension	Min	Max
Height	23.52	23.64
1/2 Span	40.86	40.98
Angle	54	56
Total Span	81.72	81.96



Comments

QC15 Inspection	05/04/2
Date	08-10-08

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	





DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D058-676-141	REV. A SHEET 1 OF 3
DATE 00.11.17		TITLE CROSSTUBE ASS'Y (OH-58 HIGH FWD) NTS	
A	00.11.17	NEW ISSUE	

Qty	Part Number	Description
X	D058-676-141	CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)
1	D6001-105	CROSSTUBE
2	D2856-400-694	ABRASION STRIP
2	D2891-1	SUPPORT
4	MS21920-20	CLAMP

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6001-105  
FINISHED LENGTH = 103.03±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-694 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2891-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

**UNDER REVIEW**

*06.10.18 PH*  
*Update View 0-0*  
*PH 08.08.20*

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RETURN TO  
ENGINEERING

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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. *4138*

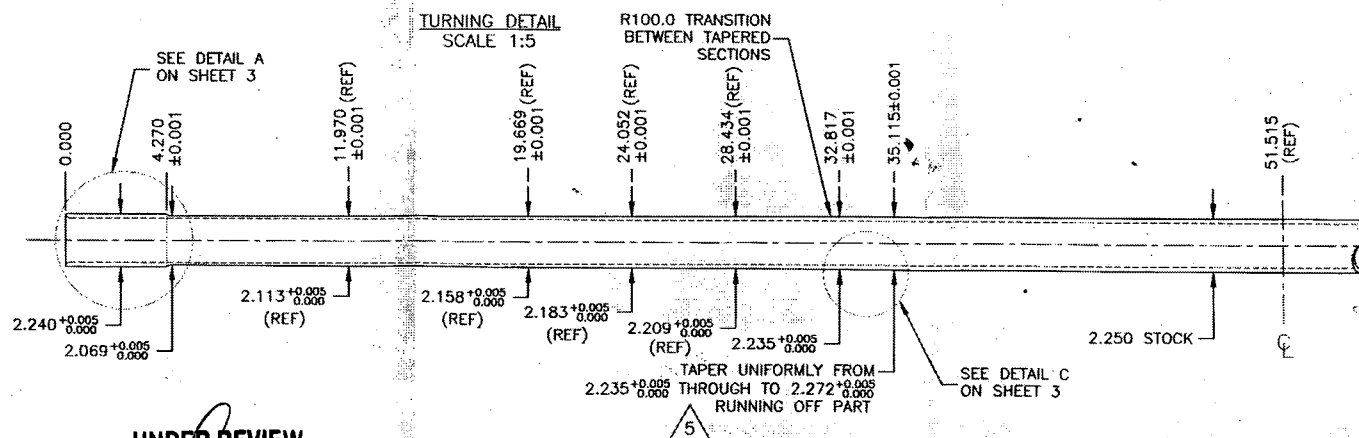
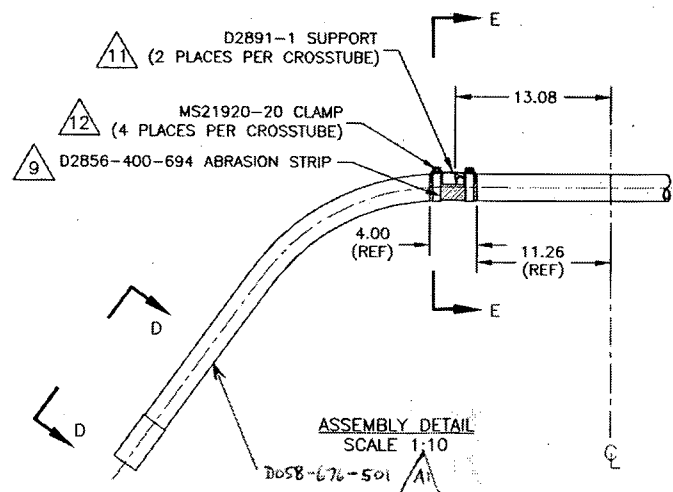
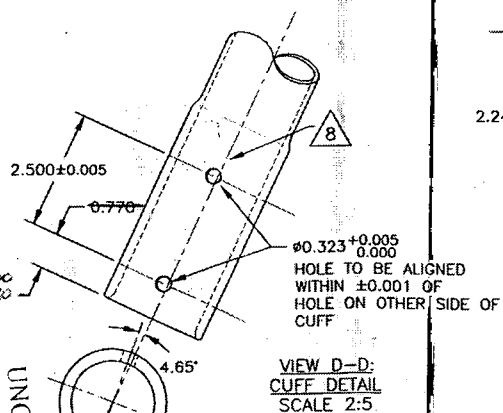
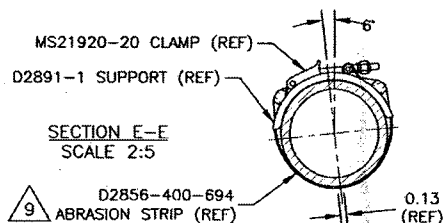
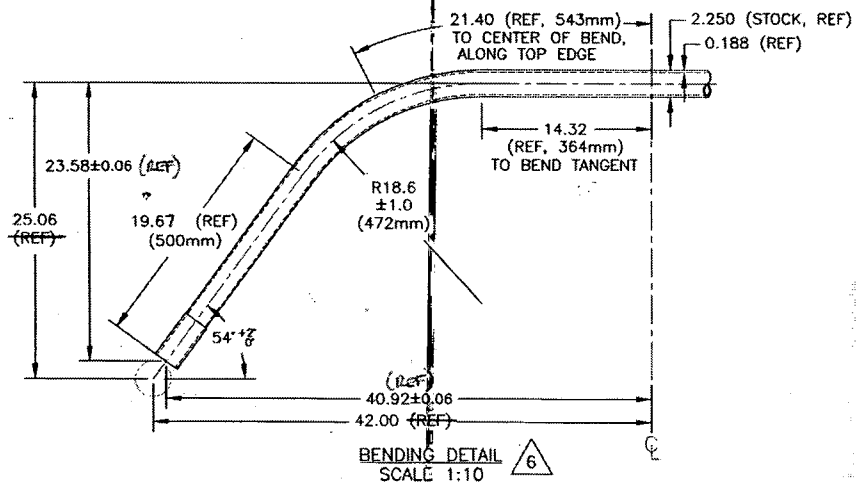
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*00.11.24 #*

A2	01.07.16	UPDATE DIM TO FIRST HOLE	<i># CP</i>
A1	01.03.07	ADD D058-676-501 P/N	<i># CP</i>

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UNDER REVIEW

06.10.13 PH  
Update View D-D

08.08.20

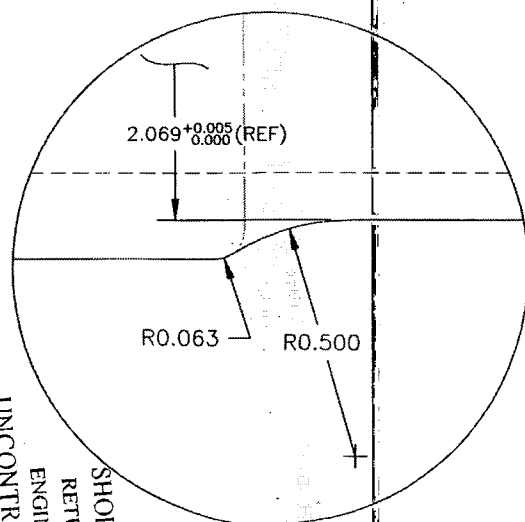
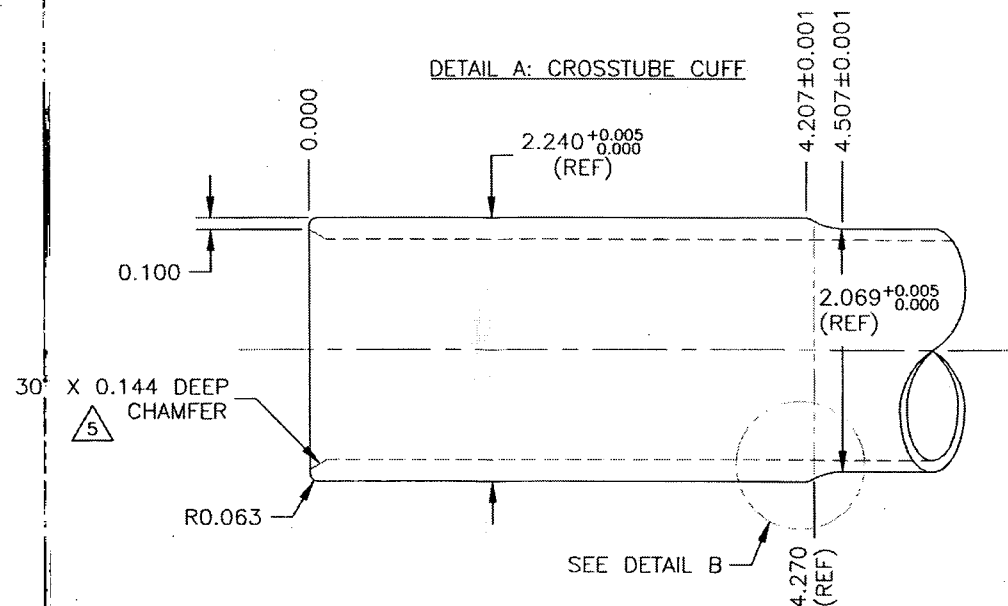
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00.11.24

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THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED CH	APPROVED CH	DRAWING NO. D058-676-141	REV. A SHEET 2 OF 3
		DATE 00.11.17		TITLE CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)	SCALE 1:10

NO. 41518  
WORK ORDER  
WITHOUT NOTICE  
SUBJECT TO AMENDMENT  
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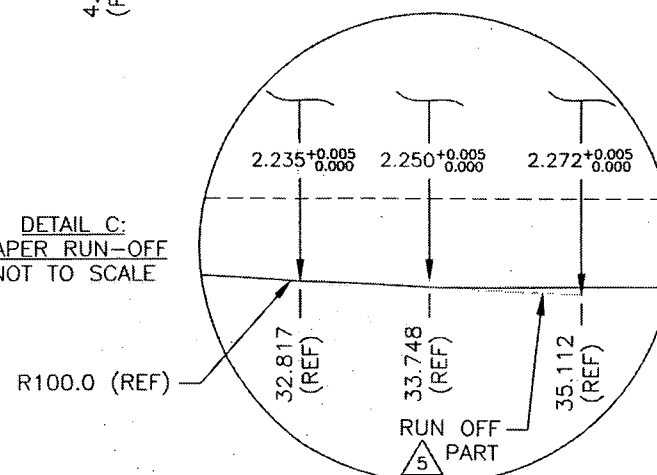
RELEASED  
00-11-24 9

DETAIL A: CROSSTUBE CUFF



DETAIL B:  
CUFF TRANSITION  
SCALE 4:1

DETAIL C:  
TAPER RUN-OFF  
NOT TO SCALE



UNDER REVIEW

06/10/18 DH  
Update view D-D

08.08.20

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DATE		00.11.17		DRAWING NO.	REV. A
				0058-676-141	SHEET 3 OF 3
				TITLE	SCALE
				CROSSTUBE ASSEMBLY (CH-53 High Fwd.)	1:1

NO. 41318  
WORK ORDER  
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## LIQUID PENETRANT TEST REPORT

P- 09128

PAGE 1 OF 1

CLIENT Dart Aerospace DATE 2008-10-20 TIME AM ☐ PM ☐  
ATTENTION Linda Lacelle ACUREN JOB NO. 188-08-1549  
ADDRESS 1270 Aberdeen st. POWO NO. \_\_\_\_\_  
Hawkesbury, ont. WORK LOCATION Hawkesbury  
ACCEPTANCE STD. ASTM 1417/1031-038 REV./DATE 2005  
PROJECT 212/205 HIGH FWD X-TUBE ASSEMBLY, 2061 AFT X-TUBE, 04-58 FWD X-TUBE ASSEMBLY,  
ITEM(S) EXAMINED Sub's 42307, 42308, 41990, 41989, 41398, 41399, 41400

JOB DESCRIPTION \_\_\_\_\_ PROCEDURE NO. LT-~~900~~ REV./DATE \_\_\_\_\_ TECHNIQUE NO. LT-~~900~~ REV./DATE \_\_\_\_\_  
PART NO. D212664101, D206667203, D058676101, D058676201 MATERIAL ALODINE ALUM. THICKNESS \_\_\_\_\_  
SCOPE WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT ON 100% EXTERNAL SURFACE

## TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>MAGNAFLUX</u>		BLACK LIGHT S/N <u>8171</u>	<input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup>	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	MINIMUM DWELL TIME	<u>30</u> MIN.	LIGHTING EQUIP. <input checked="" type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE	
PENETRANT REMOVER	MINIMUM DRY TIME	<u>&gt;10</u> MIN.	OTHER	<u>CAL FEB 12 09</u>	
DEVELOPER	MINIMUM DWELL TIME	<u>10</u> MIN.	LIGHT METER S/N _____	CAL DUE DATE _____	
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

## TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL  
SURFACE TEMPERATURE ☐ < - 4°C/ 20°F ☐ - 4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

ITEMS	COMMENTS	ACCEPT	REJECT
<u>42307</u>	<u>ACCEPTABLE</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>42308</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>41990</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>41989</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>41398</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>41399</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>41400</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE <u>[Signature]</u>	SIGNATURE	DTR #
TECHNICIAN (SIGNATURE): <u>[Signature]</u>		REPORT REVIEWED BY:
NAME (PRINT): <u>FREDERICK CHAGNON</u>	1 <sup>ST</sup> TECHNICIAN	NAME INITIALS
CGSB LEVEL <u>IV</u> SNT LEVEL <u>II</u>	CGSB LEVEL _____ SNT LEVEL _____	
CGSB REG. NO. <u>10560</u>	CGSB REG. NO. _____	

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PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PT Sept 2005

Qty -141	Part Number	Description
X	D058-676-141	CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)
1	D6001-105	CROSSTUBE
2	D2891-1	SUPPORT
4	D3595-075-400	RUBBER CUSHION
4	<del>MS21920-22</del>	CLAMP (OR MS21920-21)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

MS21920-20 ~~RF~~ 08.10.22

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6001-105  
FINISHED LENGTH = 103.03±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "206-667-141" AND BATCH NUMBER ON  
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 11.8 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,  
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 12 PASSES. MAXIMUM TUBE FLATTERING DUE  
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER  
QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS (OR -21) WITH D3595-075-400 RUBBER CUSHIONS TO SECURE  
THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS  
ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY  
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

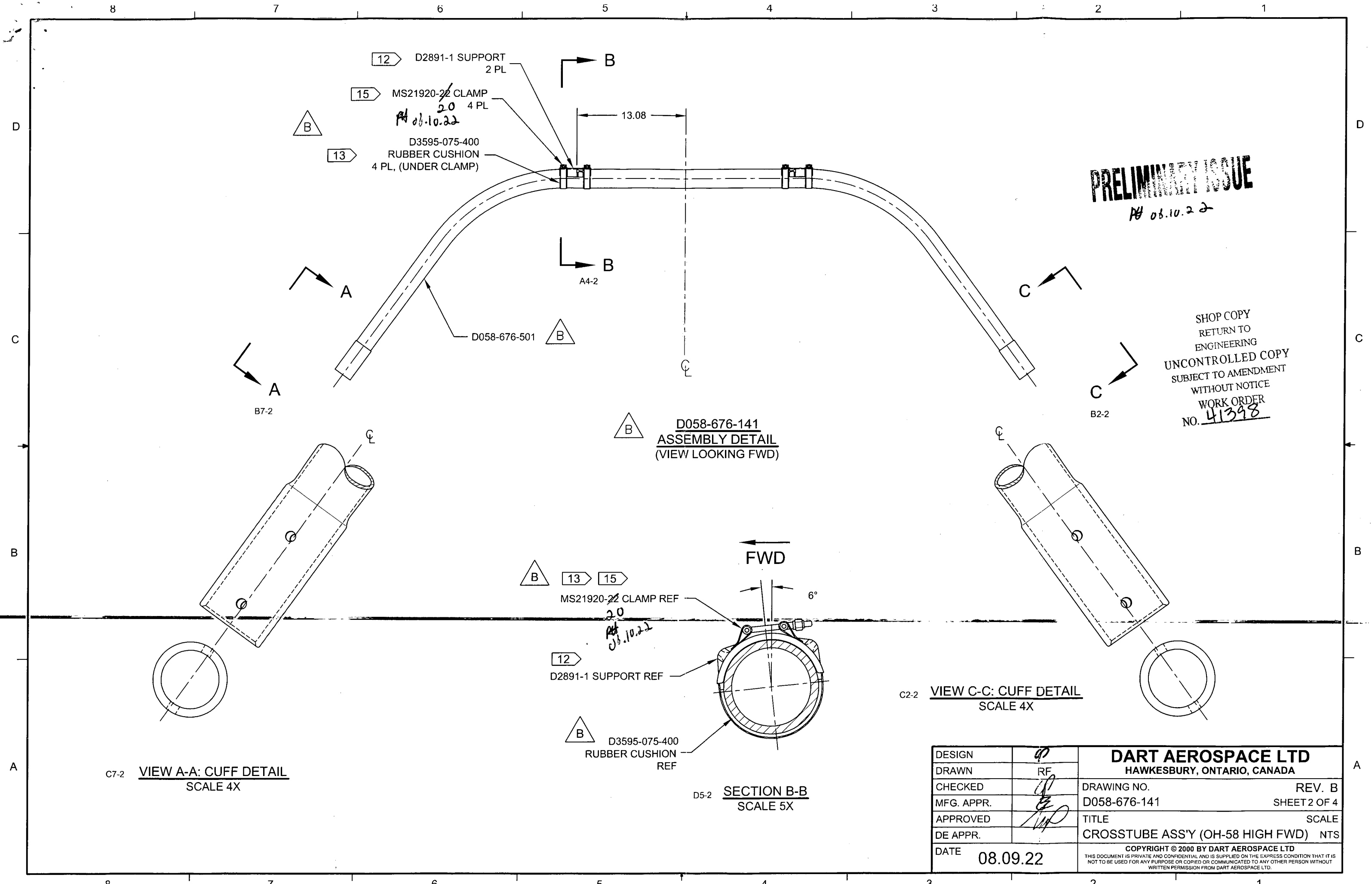
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08.10.22

B	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENTS STANDARDS. D3595-075-400 WAS D2856-400-694 (ZN D6-2 & A5-2); MS21920-22 WAS MS21920-20 (ZN D6-2 & B5-2); IDENTIFIED CROSSTUBE P/N (ZN C6-2); 0.780/500 WAS 0.700 (ZN B7-3); ADD/REMOVE REF. & ADD TOLERANCES (ZN D7-3, C4-3, C5-3 & D2-3); RELOCATED FLAG #6 (ZN A7-3) PER NCR 210; RE-ORDER TURNING DETAIL VIEW & UPDATED TOLERANCE TO SHEET 4.	RF	08.09.22
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	97		
DRAWN	RF		
CHECKED	97		
MFG. APPR.	97		
APPROVED	140		
DE APPR.			
DATE	08.09.22		

<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D058-676-141	REV. B SHEET 1 OF 4
TITLE CROSSTUBE ASS'Y (OH-58 HIGH FWD)	SCALE NTS

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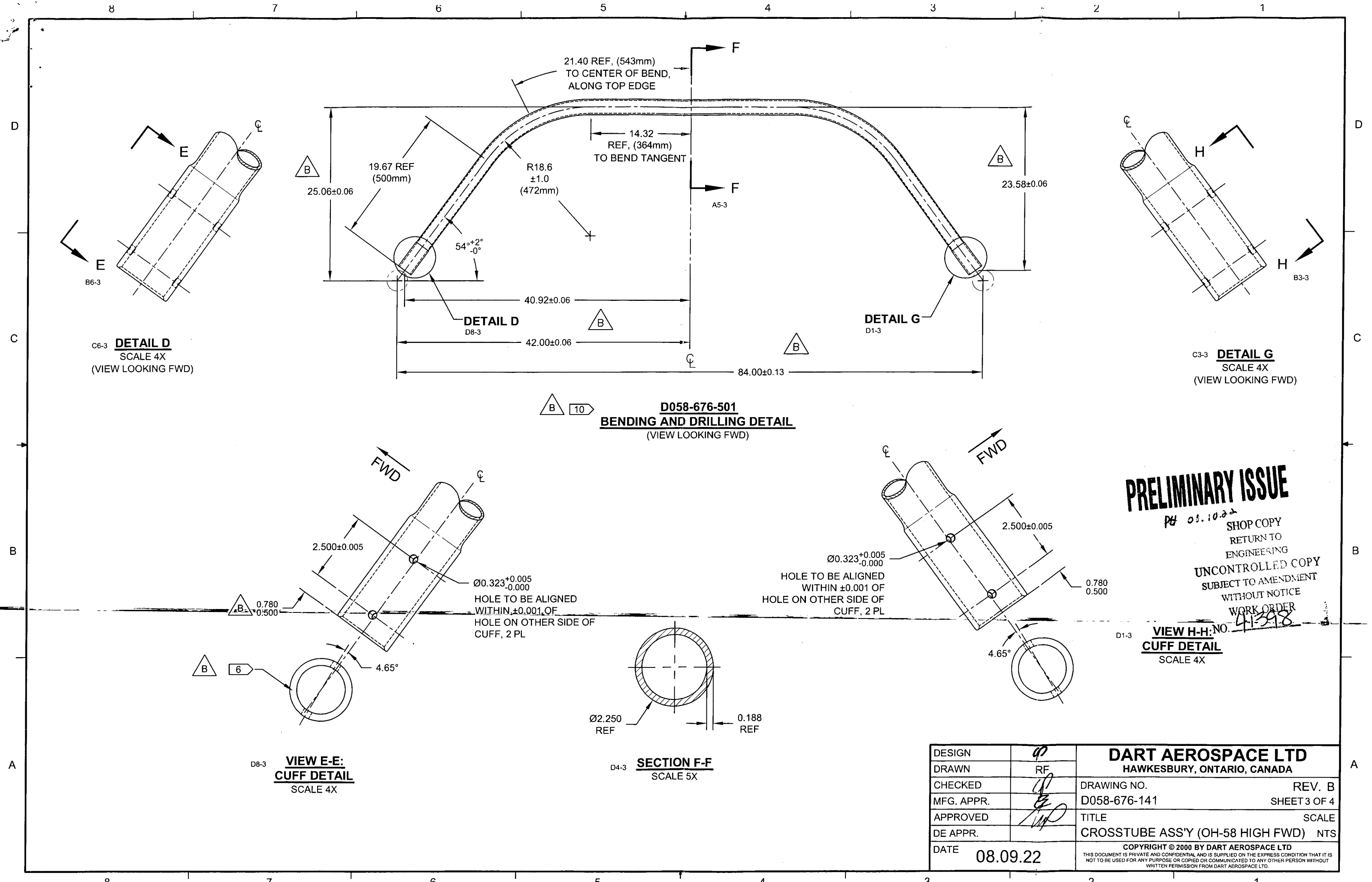
C7-2 VIEW A-A: CUFF DETAIL  
SCALE 4X

D5-2 SECTION B-B  
SCALE 5X

VIEW C-C: CUFF DETAIL  
SCALE 4X

DESIGN	40	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	40	DRAWING NO.	REV. B
MFG. APPR.	40	D058-676-141	SHEET 2 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
DATE	08.09.22	COPYRIGHT © 2000 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	





**D058-676-501**  
**BENDING AND DRILLING DETAIL**  
(VIEW LOOKING FWD)

C6-3 **DETAIL D**  
SCALE 4X  
(VIEW LOOKING FWD)

C3-3 **DETAIL G**  
SCALE 4X  
(VIEW LOOKING FWD)





D8-3 **VIEW E-E:**  
**CUFF DETAIL**  
SCALE 4X

D4-3 **SECTION F-F**  
SCALE 5X

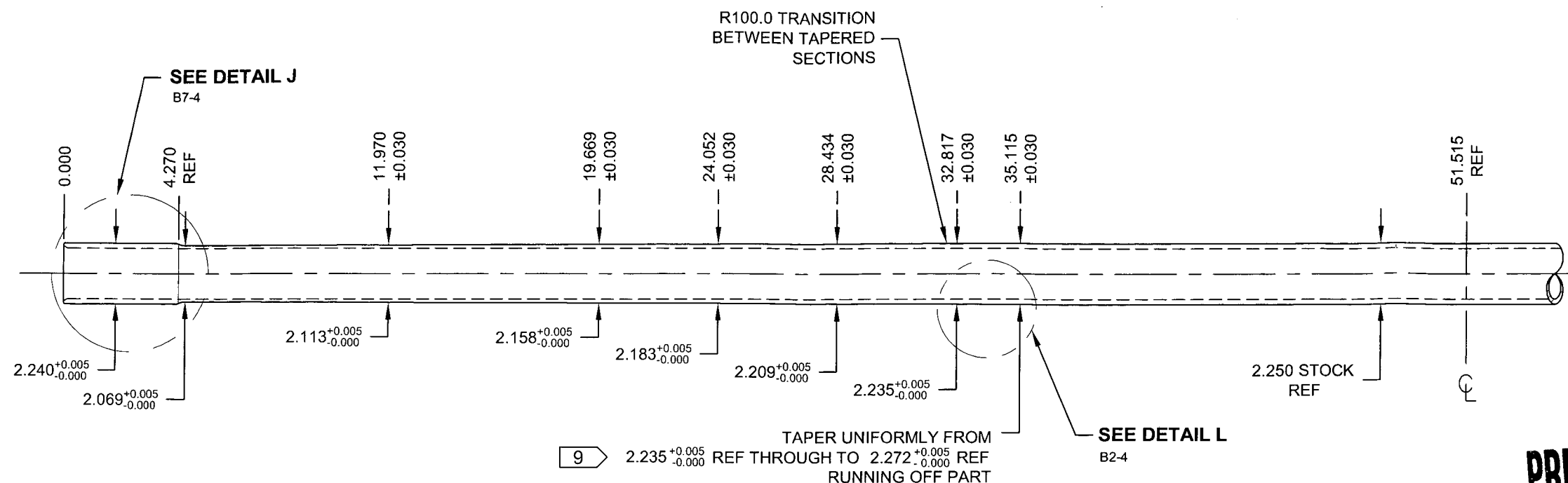
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D1-3 **VIEW H-H:**  
**CUFF DETAIL**  
SCALE 4X

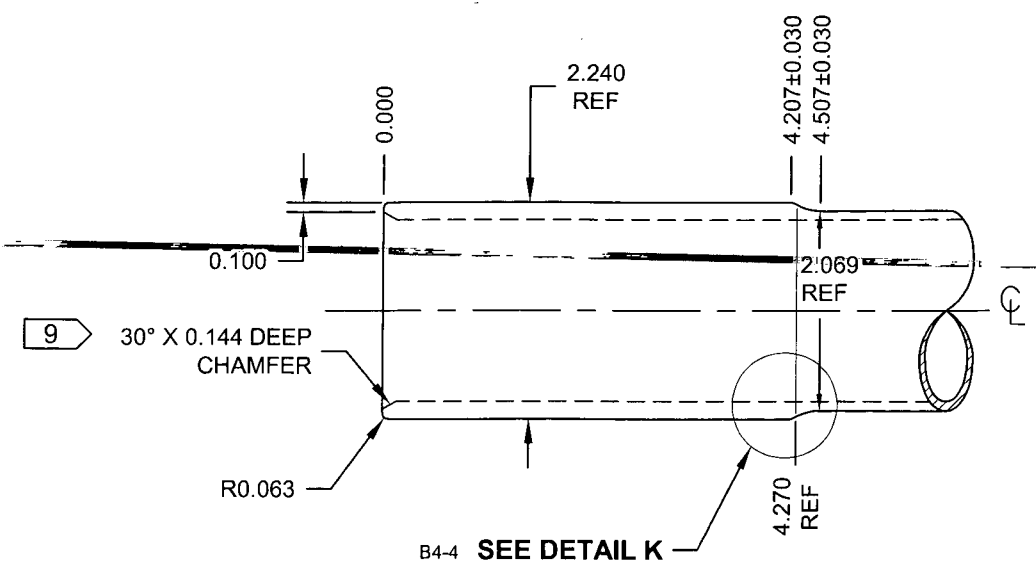
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DRAWN	RF		
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D058-676-141	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
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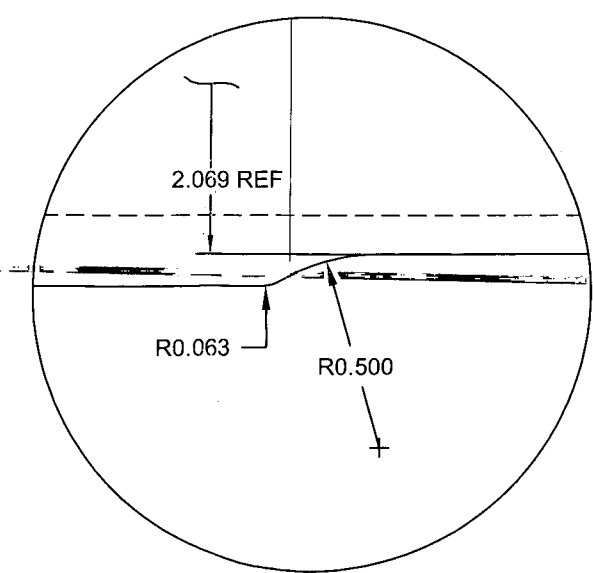


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*Rev 01.10.22*

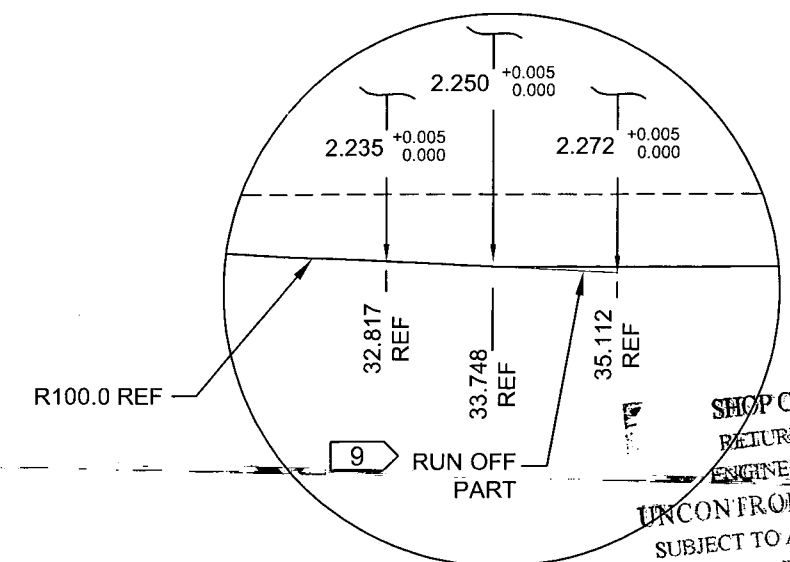
**TURNING DETAIL**



**DETAIL J:  
CROSSTUBE CUFF**  
 NOT TO SCALE



**DETAIL K:  
CUFF TRANSITION**  
 NOT TO SCALE

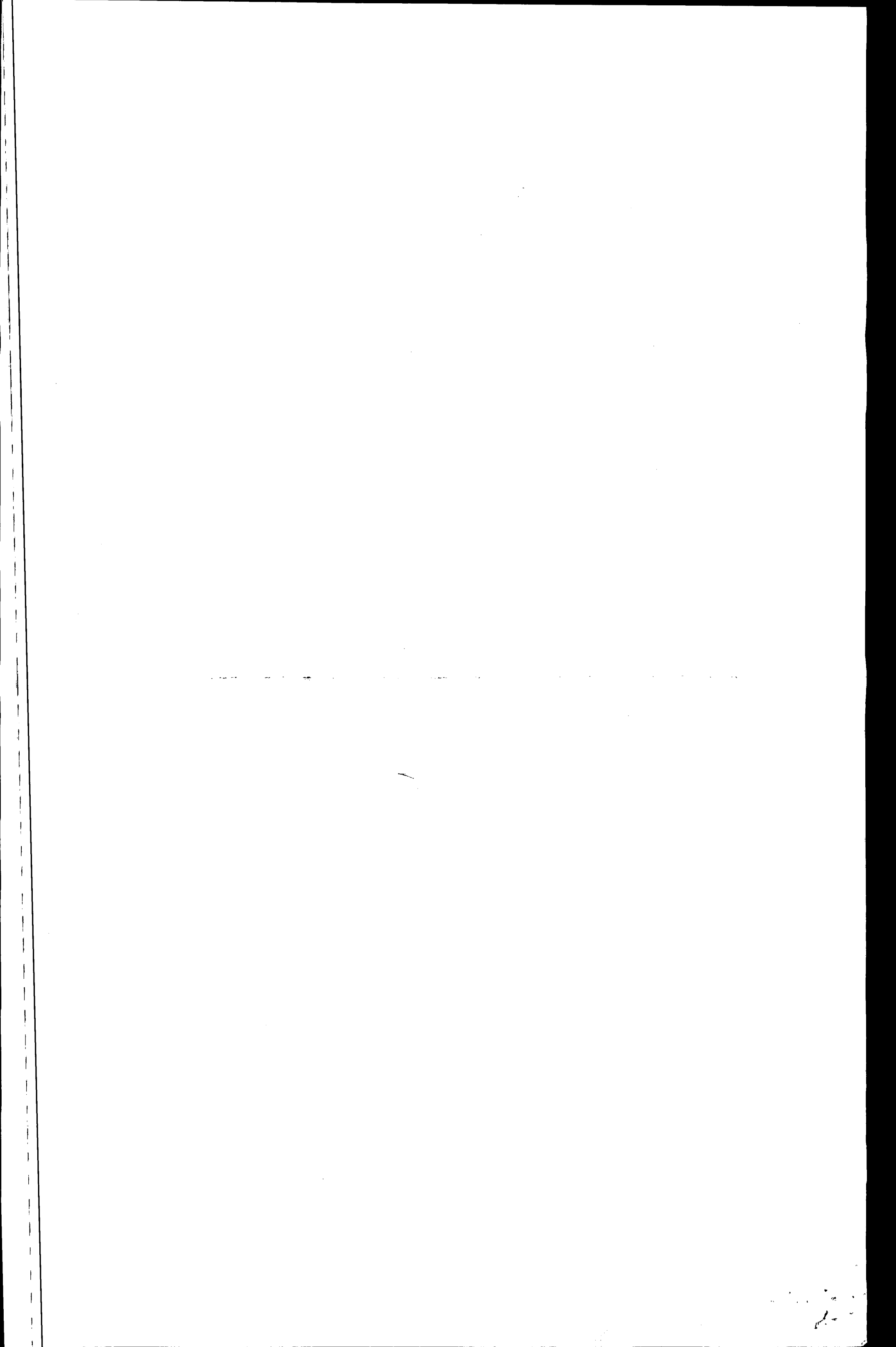


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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>ap</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>ap</i>	D058-676-141	SHEET 4 OF 4
APPROVED	<i>ap</i>	TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
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Item	Qty	Part Number	Description
	-141		
1	X	D058-676-141	CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)
2	1	D6001-105	CROSSTUBE
3	2	D2891-1	SUPPORT
4	4	D3595-063-395	RUBBER CUSHION
5	4	MS21920-20	CLAMP (OR MS21920-21)
6	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II CLASS 2 ADHESIVE)

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6001-105  
FINISHED LENGTH = 103.03±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D058-676-141" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 11.8 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 12 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**RELEASED**  
08/11/06

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B	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENTS STANDARDS. D3595-063-395 WAS D2856-400-694 (ZN D6-2 & A5-2); IDENTIFIED CROSSTUBE P/N (ZN C6-2); 0.780/500 WAS 0.700 (ZN B7-3); ADD/REMOVE REF. & ADD TOLERANCES (ZN D7-3, C4-3, C5-3 & D2-3); RELOCATED FLAG #6 (ZN A7-3) PER NCR 210; RE-ORDER TURNING DETAIL VIEW & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. B
CHECKED	RF	D058-676-141	SHEET 1 OF 4
MFG. APPR.	RF	TITLE	SCALE
APPROVED	RF	CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
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DATE	08.11.06		

8 7 6 5 4 3 2 1

D

C

B

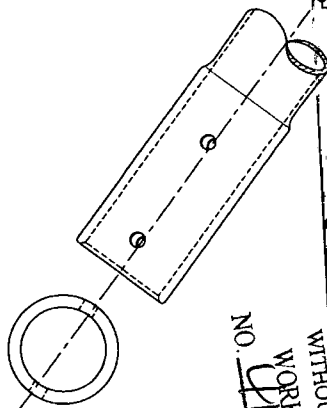
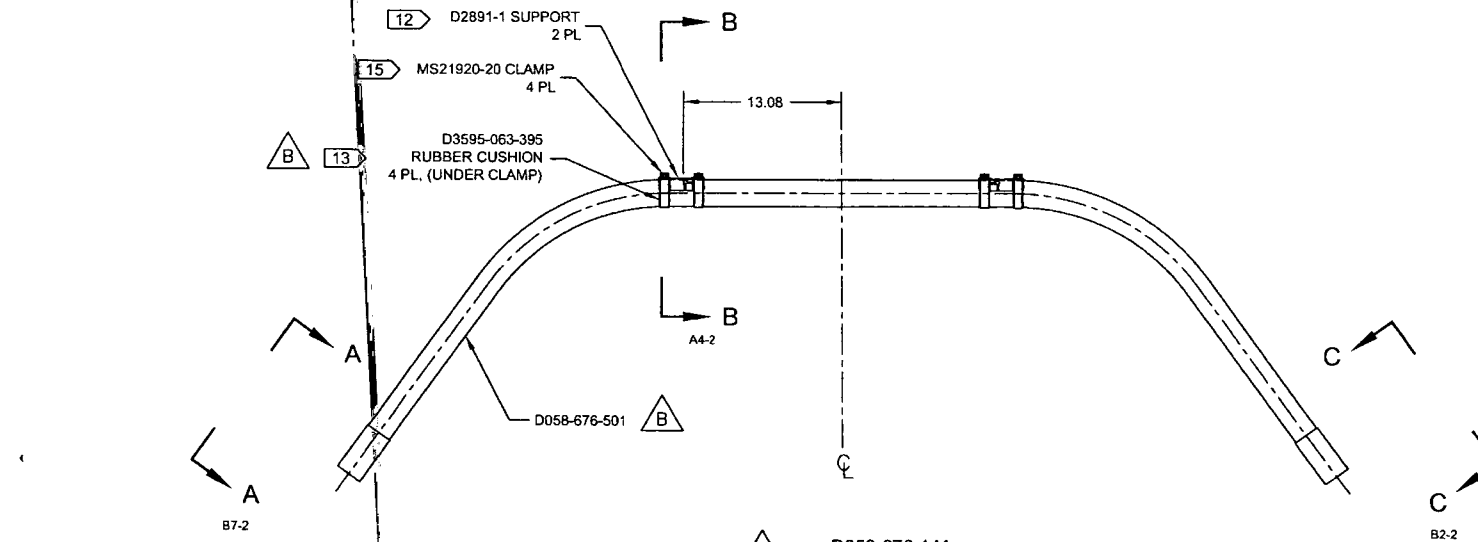
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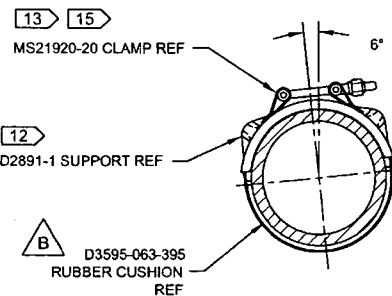
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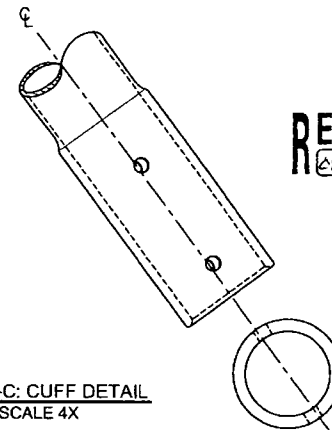


C7-2 VIEW A-A: CUFF DETAIL  
SCALE 4X

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D8-2 SECTION B-B  
SCALE 5X

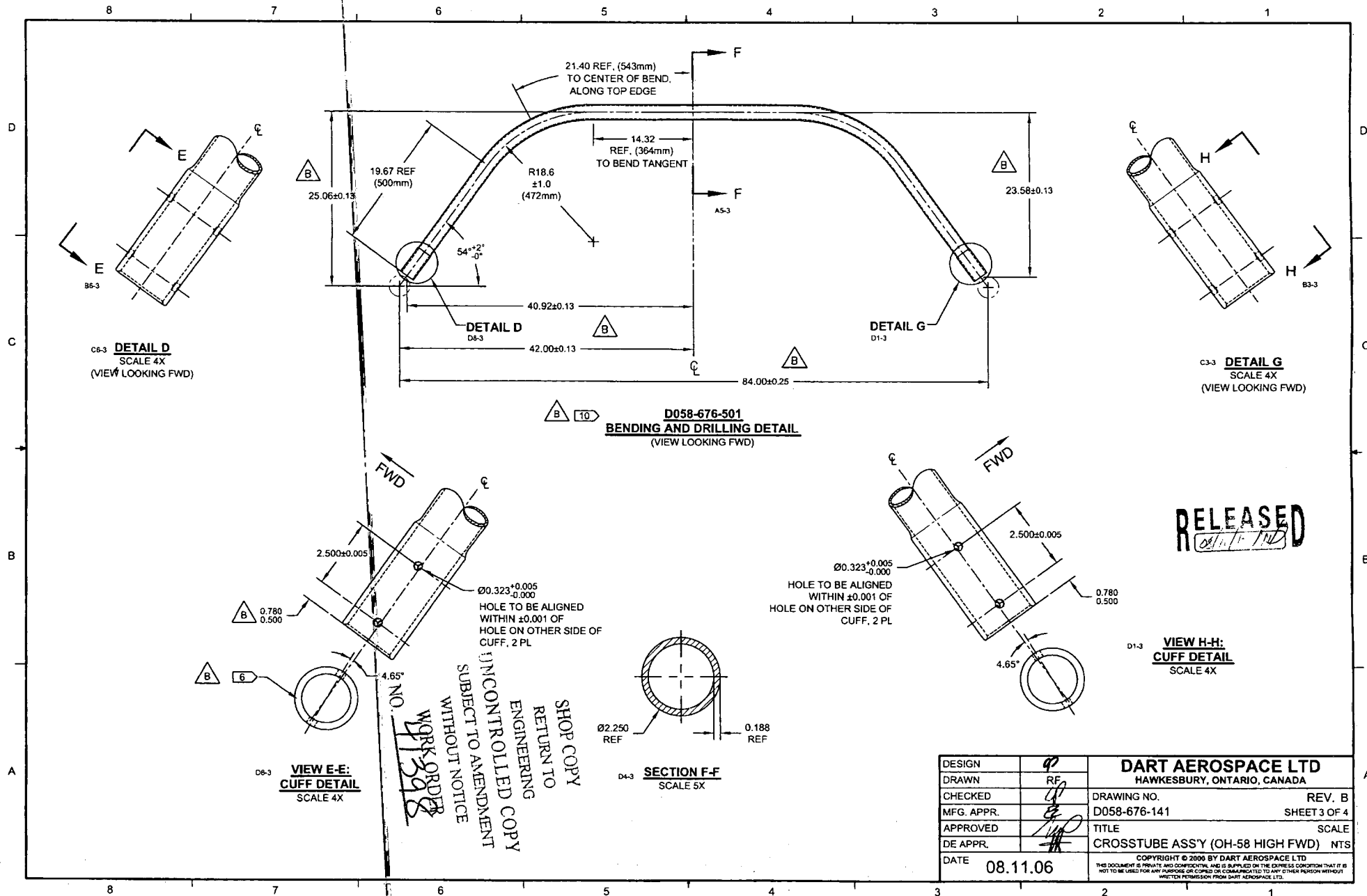


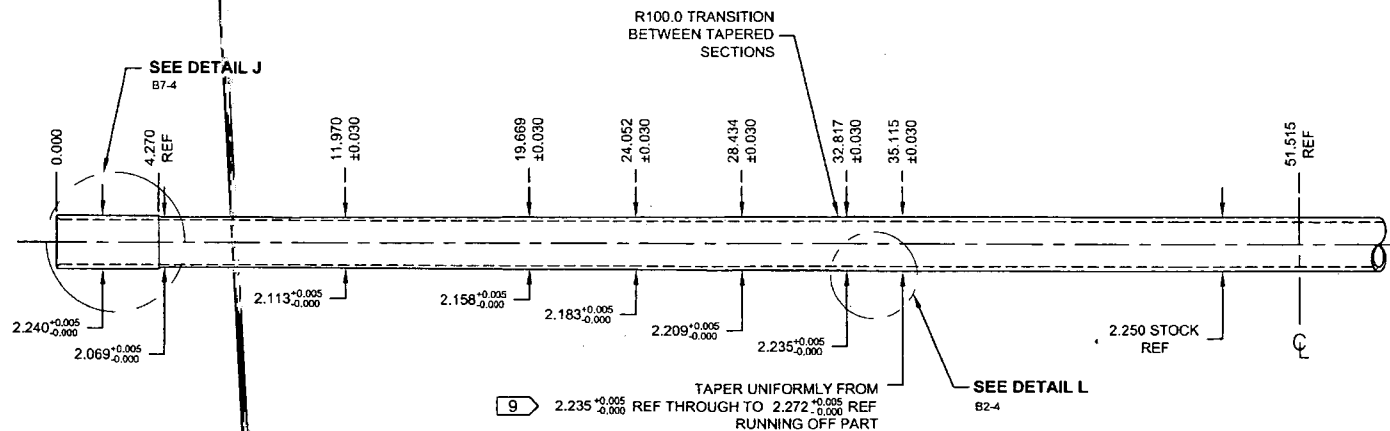
C2-2 VIEW C-C: CUFF DETAIL  
SCALE 4X

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22/11/12

DESIGN	97	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	4	DRAWING NO.	REV. B
MFG. APPR.	4	D058-676-141	SHEET 2 OF 4
APPROVED	4	TITLE	SCALE
DE APPR.	4	CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
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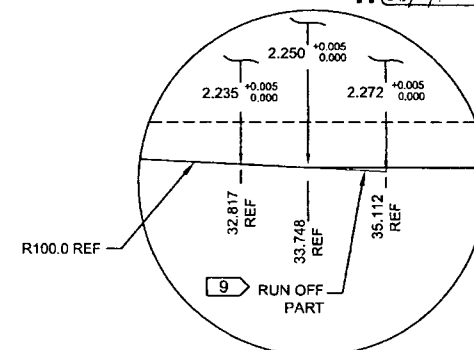
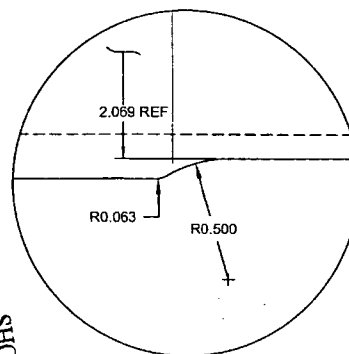
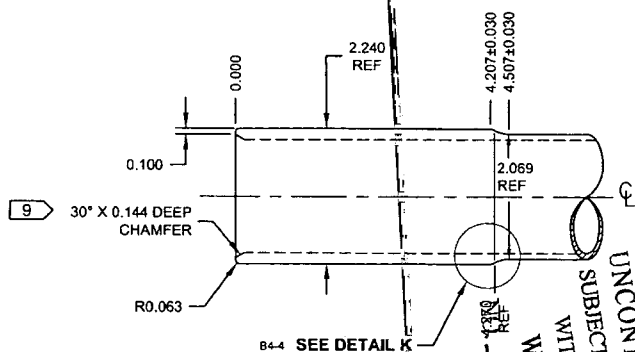
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**B** TURNING DETAIL

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APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (OH-58 HIGH FWD)	NTS
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